IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Robert P. Rouen	§	Art Unit:	3672
Serial No.:	10/711,820	§		
		§	Examiner:	David L. Andrews
Filed:	October 7, 2004	§		
For:	Gas Lift Apparatus and Method for Producing a Well	§	Atty. Dkt. No.:	SHL.0343US (68.0496)

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Commissioner for Patents
P.O. Box 1450
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APPEAL BRIEF PURSUANT TO 37 C.F.R § 41.37

Sir:

The final rejection of claims 1-11, 13-16, 18-20, 22-24 is hereby appealed.

I. REAL PARTY IN INTEREST

The real party in interest is Schlumberger Technology Corporation.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF THE CLAIMS

Claims 1-11, 13-16, 18-20, and 22-24 have been finally rejected and are the subject of this appeal. Claims 12, 17, and 21 have been cancelled.

Date of Deposit: June 3, 2008

I hereby certify that this correspondence is being electronically transmitted to the U.S. Patent Office on the date indicated above.

Ginger Yount

Ginger Yount

IV. STATUS OF AMENDMENTS

An Amendment after final was submitted on February 6, 2008. This Amendment was not entered by the Examiner for purposes of appeal.

An Amendment Under 37 C.F.R. § 41.33(b) is submitted concurrently with this Appeal Brief. The Amendment Under 37 C.F.R. § 41.33(b) cancels claim 12, and amends dependent claim 22 from dependent form to independent form, with its scope unchanged. Therefore, under § 41.33(b), entry of the Amendment is proper.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 1 recites a gas injection apparatus, comprising:

> a tubular member (Fig. 1:60) defining an axial bore therethrough, the axial bore adapted to deliver a gas into a wellbore proximate a perforation interval via orifices (Spec., p. 4, ¶ [016]; p. 5, ¶ [017]); and
>
> a plurality of gas lift valves (Fig. 1:62A, 62B, 62C) attached to the tubular member, the gas lift valves adapted to regulate communication, via the corresponding orifices, from the axial bore of the tubular member to the wellbore at or below the perforation interval (Spec., p. 5, ¶ [017]).

Independent claim 7 recites a gas lift system for use in producing a well having a perforation interval, the system comprising:

> a sealing mechanism (Fig. 1:30) adapted to seal the well at a location above the perforation interval, the sealing mechanism having two ports therein (Spec., p. 4, ¶ [016]);
>
> a tubular string (Fig. 1:40) adapted to produce fluid from the perforation interval via one port in the sealing mechanism (Spec., p. 4, ¶ [016]); and
>
> an injection tool (Fig. 1:60) adapted to inject gas into the well at or below the perforation interval via the other port in the sealing mechanism, the injection tool having plural gas lift valves (Fig. 1:62A, 62B, 62C) for delivering the injected gas into the well at a location below the sealing mechanism and at or below the perforation interval (Spec., p. 4, ¶ [016]; p. 5, ¶ [017]).

Independent claim 13 recites a method for unloading an accumulated liquid from a well having a perforation interval proximate a gas-bearing formation, wherein hydrostatic pressure of the accumulated liquid exceeds pressure of produced gas, the method comprising:

> sealing the formation in the well at a location above the perforation interval (Spec., p. 4, ¶ [016]);
>
> providing a tubing string (Fig. 1:40) for establishing communication between surface and a point below the sealing location (Spec., p. 4, ¶ [016]);
>
> providing a gas injection tool (Fig. 1:60) having a plurality of gas lift valves (Fig. 1:62A, 62B, 62C) for establishing communication between a point above the sealing location and the perforation interval below the sealing location (Spec., p. 4, ¶ [016]; p. 5, ¶ [017]);
>
> delivering gas into the well at or below the perforation interval via the plurality of gas lift valves of the gas injection tool to decrease the hydrostatic pressure of the accumulated liquid to a level sufficient to permit gas to be produced from the formation (Spec., p. 5, ¶ [017]); and
>
> removing the accumulated liquid and gas from the well via the tubing string (Spec., p. 5, ¶ [017]).

Independent claim 14 recites a gas lift system for use in producing a wellbore having perforations proximate a gas-bearing formation, the system comprising:

> a dual-port packer (Fig. 5:30) adapted to seal the wellbore at a location above the perforations, the sealing mechanism having two ports therein (Spec., p. 4, ¶ [016]);
>
> a tubing string (Fig. 5:40) adapted to deliver gas from the perforations proximate the formation via one port in the packer to a surface location, wherein the tubing string has a valve (Fig. 5:42A) that is actuated in response to gas pressure in a well annulus outside the tubing string exceeding a predetermined level (Spec., p. 5, lines 20-27); and
>
> an injection tool (Fig. 5:60) adapted to inject gas from a surface location into the wellbore at or below the perforations via the other port in the packer, the injection tool having a plurality of gas lift valves (Fig. 5:62A, 62B, 62C) for delivering the injected gas into the wellbore at a location below the packer (Spec., p. 4, ¶ [016]; p. 5, ¶ [017]).

Independent claim 22 recites a method for producing through a wellbore having a perforation interval proximate a formation, comprising:

> injecting gas into the wellbore at or below the perforation interval (Spec., p. 5, ¶ [017]),
>
> wherein injecting the gas comprises injecting the gas using an injecting tool (Fig. 1:60) having plural gas lift valves (Fig. 1:62A, 62B, 62C);
>
> actuating a first one of the gas lift valves when the injected gas reaches a first pressure (Spec., p. 5, ¶ [017]); and
>
> actuating a second one of the gas lift valves when the injected gas reaches a second, greater pressure (Spec., p. 5, ¶ [017]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1-13, 15, And 24 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. Patent No. 2,798,558 (McCulloch) In View Of U.S. Patent No. 2,725,014 (Pryor).

B. Claim 14, 16, 18-20, 22, And 23 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over McCulloch In View Of Pryor And U.S. Patent No. 3,192,869 (McCarvell).

VII. ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

A. Claims 1-13, 15, And 24 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. Patent No. 2,798,558 (McCulloch) In View Of U.S. Patent No. 2,725,014 (Pryor).

1. Claims 1-6, 15.

Claim 1 was rejected as purportedly obvious over McCulloch and Pryor.

To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as the U.S. Supreme Court held, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

Here, an analysis of the teachings of McCulloch and Pryor would reveal that a person of ordinary skill in the art would not have been prompted to combine the teachings of McCulloch and Pryor to achieve the claimed invention.

As conceded by the Examiner, McCulloch does not disclose gas lift valves associated with the orifices 71 depicted in the telescopic member 70 in Fig. 6 of McCulloch. 12/7/2007 Office Action at 4.

Instead, the Examiner relied upon Pryor as disclosing the use of "gas lift valves" 16, 17, 18, 19, or 23, 24, 25, 26 "to regulate communication between the axial bore of the tubular member to the wellbore (col. 4, lines 2-7)." *Id.*

McCulloch does **not** contemplate the provision of any valves associated with the lateral ports 71 or opening in the lower end 72 of the telescopic member 70 depicted in Fig. 6 of McCulloch. In fact, provision of gas lift valves associated with the lateral port 71 or lower end 72 of McCulloch would clearly not be desirable, as doing so would involve significant changes to the completion system of McCulloch that would clearly change the principle of operation of McCulloch.

As depicted in the various figures of McCulloch, including Figs. 1-4, a production tubing 15 is provided in the wellbore, where the tubing 15 should be of sufficient size to allow for tools, such as a tubing gun perforator to be run through the interior of the tubing 15. This suggests that the tubing 15 would occupy a substantial amount of the interior space of the wellbore.

The offset elongated conduit 21 or 34, provided in an annulus region outside the tubing 15, depicted in the various figures of McCulloch is provided to allow for provision of an injected fluid, such as a corrosion inhibitor (McCulloch, 3:71), cementing fluid (4:19-20), or washing fluid (5:16) into the wellbore below packer 19. Since the offset elongated conduit 21 or 34 of McCulloch is provided adjacent the tubing 15, this elongated conduit 34 by necessity has to be designed with relatively small diameter. In addition, since the telescopic member 70 that is provided with the lateral ports 71 has be **moveable within** the elongated conduit 34, the

telescopic member 70 has to be designed with an **even smaller** diameter than the elongated conduit 34. A person of ordinary skill in the art would therefore recognize that the telescopic member 70 of McCulloch should be designed with reduced diameter.

In contrast, the Examiner is proposing a modification of the telescopic member 70 of McCulloch to incorporate the valves 16-19 or 23-28 of Pryor, which would clearly result in a telescopic member 70 having a substantially enlarged diameter. One implementation of the valves of Pryor is for attachment to the outside of the tubing 11 depicted in Pryor. However, attaching valves to the outside of the telescopic member 70 would render the telescopic member 70 **inoperable for its intended purpose**, namely, having the ability to move axially up and down inside the elongated conduit 34. Alternatively, Pryor also mentions that its valves could be secured inside the tubing 11 of Pryor. Although provision of the valves inside the tubing 11 of Pryor makes sense since the tubing 11 is a production tubing similar to tubing 15 depicted in McCulloch, providing the valves inside the telescopic member 70 of McCulloch would make no sense, since that would significantly enlarge the diameter of the telescopic member 70, which may in fact cause reduction in size of the tubing 15 such that running of a tool such as the perforating gun shown in Fig. 4 of McCulloch through the tubing 15 of McCulloch would no longer be possible.

Thus, when the teachings of McCulloch and Pryor are considered in their entirety, a person of ordinary skill in the art clearly would not have been prompted to incorporate the valves of Pryor into the telescopic member 70 of McCulloch.

A reason stated by the Examiner for combining the valves of Pryor into McCulloch is that providing the valves of Pryor would "eliminat[e] the need to manually adjust the valves (col. 2, lines 16+)." 12/7/2007 Office Action at 2. However, it is noted that the two-way valve shown

in the various figures of McCulloch already can be operated without manual adjustment of the valves; *i.e.*, the two-way valve could be operated from the surface. Therefore, adding the valves of Pryor into McCulloch would not have been any more advantageous for the reasons stated by the Examiner, since McCulloch already provides for remote control from the surface. In fact, incorporating the valves of Pryor into the telescopic member 70 of McCulloch would have actually resulted in additional complexity in the system of McCulloch, and also would have required a telescopic member 70 of enlarged diameter which would have taken up valuable space inside the wellbore. This strongly suggests that a person of ordinary skill in the art would not have been prompted to combine the teachings of McCulloch and Pryor to achieve the claimed invention.

The Examiner stated that the teaching in column 3, at lines 40-41, of McCulloch that the lower end 72 of the telescopic member 70 "may be opened or closed as may be desired" "illustrates the desire to control not only the lower end orifice but all orifice's since the McCulloch [sic] recognizes that different production environments may prompt the user to desire different flow configurations." 12/7/2007 Office Action at 2-3. The quoted passage in column 3 of McCulloch actually refers to the fact that the lower end 72 of the telescopic member would be **permanently** opened or closed; there is absolutely no teaching or hint in McCulloch of providing any type of valve at the lower end 72 of the telescopic member 70, since doing so would require an enlarged telescopic member 70 that would add complexity and cost to the system.

In view of the foregoing, it is respectfully submitted that the Examiner has erred in rendering the obviousness rejection of claim 1 and its dependent claims over McCulloch and Pryor.

Reversal of the final rejection of the above claims is respectfully requested.

2. Claim 24.

Claim 24 depends from claim 1, and is therefore allowable for at least the same reasons as claim 1.

Moreover, claim 24 recites that a plurality of gas lift valves are located at or below the perforation interval.

Neither McCulloch nor Pryor discloses or hints at providing a plurality of gas lift valves at or below the perforation interval. As conceded by the Examiner, McCulloch fails to disclose the provision of valves with its telescopic member 70 (*see* Fig. 6). On the other hand, the valves of Pryor are all located **above** any perforation interval. Note that the valves 16-19 or 23-28 of Pryor are positioned within non-perforated casing. Thus, it appears that the fluids would come from an un-cased portion of the wellbore below the casing. Therefore, the hypothetical combination of McCulloch and Pryor would clearly not have led to a plurality of gas lift valves at or below the perforation interval, as recited in claim 24.

Claim 24 is further allowable for the foregoing reason.

Reversal of the final rejection of the above claim is respectfully requested.

3. Claims 7-11.

Independent claim 7 was also rejected as purportedly being obvious over McCulloch and Pryor. With respect to claim 7, for similar reasons as stated above with respect to claim 1, a person of ordinary skill in the art would not have been prompted to combine McCulloch and Pryor to achieve the claimed subject matter.

Moreover, the hypothetical combination of McCulloch and Pryor would not have led to the following claimed subject matter:

> an injection tool adapted to inject gas into the well at or below the perforation interval via the other port in the sealing mechanism, the injection tool having plural gas lift valves for delivering the injected gas into the well at a location below the sealing mechanism and at or below the perforation interval.

Therefore, claim 7 and its dependent claims are non-obvious over McCulloch and Pryor.

Reversal of the final rejection of the above claims is respectfully requested.

4. Claim 13.

Independent claim 13 was also rejected as being purportedly obvious over McCulloch and Pryor.

For reasons similar to those stated above with respect to claim 1, no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of McCulloch and Pryor. Moreover, the hypothetical combination of McCulloch and Pryor would not have led to the following subject matter of claim 13:

- providing a gas injection tool having a plurality of gas lift valves for establishing communication between a point above the sealing location and the perforation interval below the sealing location;
- delivering gas into the well at or below the perforation interval via the plurality of gas lift valves of the gas injection tool to decrease the hydrostatic pressure of the accumulated liquid to a level sufficient to permit gas to be produced from the formation;

For the foregoing reasons, it is respectfully submitted that the obviousness rejection of claim 13 is erroneous.

Reversal of the final rejection of the above claim is respectfully requested.

B. Claims 14, 16, 18-20, 22, And 23 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over McCulloch In View Of Pryor And U.S. Patent No. 3,192,869 (McCarvell).

1. Claim 14.

Independent claim 14 was rejected as being purportedly obvious over McCulloch, Pryor, and McCarvell. Since no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of McCulloch and Pryor, it is respectfully submitted that McCarvell would also not have provided any reason to combine McCulloch, Pryor, and McCarvell to incorporate valves into the telescopic member 70 of McCulloch. Like Pryor, McCarvell discloses the provision of valves (V-1, V-2, V-3) on a production tubing T. Therefore, the Examiner also erred in rendering the obviousness rejection of claim 14 over McCulloch, Pryor, and McCarvell.

Reversal of the final rejection of the above claim is respectfully requested.

2. Claims 22, 23.

Independent claim 22 was also rejected as being obvious over McCulloch, Pryor, and McCarvell. With respect to claim 22, the Examiner further cited specifically to the teaching of Pryor in column 3, lines 4-22, regarding actuation of fluid controlled valves at different pressures. 12/7/2007 Office Action at 5. However, the actuation of different valves at different pressures is in the context of valves provided in a production tubing 11. For reasons similar to those stated above, a person of ordinary skill in the art would not have been prompted to incorporate the valves of Pryor into the telescopic member 70 of McCulloch. Similarly, McCarvell also teaches the actuation of different valves at different pressures, where the valves are associated with the production tubing T. As noted above, a person of ordinary skill in the art

would also not have been prompted to incorporate the valves of McCarvell into the telescopic member 70 of McCulloch.

Reversal of the final rejection of the above claims is respectfully requested.

3. Claims 16, 18, 19, 20.

In view of the defective obviousness rejection of base claim 1 over McCulloch and Pryor, it is respectfully submitted that the obviousness rejection of dependent claims 16, 18, 19, and 20 over McCulloch, Pryor, and McCarvell is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

CONCLUSION

In view of the foregoing, reversal of all final rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

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VIII. APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

1. A gas injection apparatus, comprising:

a tubular member defining an axial bore therethrough, the axial bore adapted to deliver a gas into a wellbore proximate a perforation interval via orifices; and

a plurality of gas lift valves attached to the tubular member, the gas lift valves adapted to regulate communication, via the corresponding orifices, from the axial bore of the tubular member to the wellbore at or below the perforation interval.

2. The gas injection apparatus of claim 1, further comprising a sealing mechanism to seal the wellbore above the perforation interval,

wherein the tubular member is adapted to engage the sealing mechanism.

3. The gas injection apparatus of claim 2, wherein the sealing mechanism is a dual-port packer.

4. The gas injection apparatus of claim 1, wherein the tubular member is adapted to inject a gas proximate the perforation interval of a gas-bearing well.

5. The gas injection apparatus of claim 1, wherein the tubular member is adapted to inject a gas proximate the perforation interval of an oil-bearing well.

6. The gas injection apparatus of claim 1, further comprising a retrieving element attached to the tubular member.

7. A gas lift system for use in producing a well having a perforation interval, the system comprising:

a sealing mechanism adapted to seal the well at a location above the perforation interval, the sealing mechanism having two ports therein;

a tubular string adapted to produce fluid from the perforation interval via one port in the sealing mechanism; and

an injection tool adapted to inject gas into the well at or below the perforation interval via the other port in the sealing mechanism, the injection tool having plural gas lift valves for delivering the injected gas into the well at a location below the sealing mechanism and at or below the perforation interval.

8. The gas lift system of claim 7, wherein the tubular string comprises one or more gas lift valves for injecting a gas into the well at a location above the sealing mechanism.

9. The gas lift system of claim 7, wherein the sealing mechanism is a dual-port packer.

10. The gas lift system of claim 7, wherein the well is a gas-bearing well.

11. The gas lift system of claim 7, wherein the well is an oil-bearing well.

13. A method for unloading an accumulated liquid from a well having a perforation interval proximate a gas-bearing formation, wherein hydrostatic pressure of the accumulated liquid exceeds pressure of produced gas, the method comprising:

sealing the formation in the well at a location above the perforation interval;

providing a tubing string for establishing communication between surface and a point below the sealing location;

providing a gas injection tool having a plurality of gas lift valves for establishing communication between a point above the sealing location and the perforation interval below the sealing location;

delivering gas into the well at or below the perforation interval via the plurality of gas lift valves of the gas injection tool to decrease the hydrostatic pressure of the accumulated liquid to a level sufficient to permit gas to be produced from the formation; and

removing the accumulated liquid and gas from the well via the tubing string.

14. A gas lift system for use in producing a wellbore having perforations proximate a gas-bearing formation, the system comprising:

a dual-port packer adapted to seal the wellbore at a location above the perforations, the sealing mechanism having two ports therein;

a tubing string adapted to deliver gas from the perforations proximate the formation via one port in the packer to a surface location, wherein the tubing string has a valve that is actuated in response to gas pressure in a well annulus outside the tubing string exceeding a predetermined level; and

an injection tool adapted to inject gas from a surface location into the wellbore at or below the perforations via the other port in the packer, the injection tool having a plurality of gas lift valves for delivering the injected gas into the wellbore at a location below the packer.

15. The gas injection apparatus of claim 1, wherein the gas lift valves are arranged on a side of the tubular member to enable injected gas to pass in a radial direction of the tubular member into the wellbore through the corresponding orifices.

16. The gas injection apparatus of claim 1, wherein a first of the gas lift valves is actuated in response to the gas reaching a first gas pressure, and a second of the gas lift valves is actuated in response to the gas reaching a second, different gas pressure.

18. The gas injection apparatus of claim 16, wherein the first gas lift valve is closed once the delivered gas reaches the second pressure.

19. The gas lift system of claim 7, wherein a first of the plural gas lift valves is actuatable in response to the gas reaching a first gas pressure, and a second of the plural gas lift valves is actuatable in response to the gas reaching a second, different gas pressure.

20. The gas lift system of claim 19, wherein the plural gas lift valves are configured to sequentially actuate in response to the injected gas reaching different pressures.

22. A method for producing through a wellbore having a perforation interval proximate a formation, comprising:

injecting gas into the wellbore at or below the perforation interval,

wherein injecting the gas comprises injecting the gas using an injecting tool having plural gas lift valves;

actuating a first one of the gas lift valves when the injected gas reaches a first pressure; and

actuating a second one of the gas lift valves when the injected gas reaches a second, greater pressure.

23. The method of claim 22, further comprising closing the first gas lift valve when the injected gas reaches the second pressure.

24. The gas injection apparatus of claim 1, wherein the plurality of gas lift valves are located at or below the perforation interval.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.